**How Photosynthesis works: Actively learn ASSIGNMENT**

Watch this video before reading the article. <https://www.youtube.com/watch?v=3pD68uxRLkM>

What do you do when you get hungry? You ask your mom for something to eat, don’t you? Or you may even go to the kitchen and fix yourself something to eat. Well, plants get hungry just like you and I do.

QUESTION 1

what is the human system called in which we eat?

But since plants don’t have parents (or kitchens), they have to make their own food. When plants make their own food, it is called photosynthesis.

Photosynthesis is a big word, isn’t it? It means light (photo) used to make something (synthesis). Hhmmm…can you guess how plants make their food?

If you guessed the sun, you are right! Here’s how it works…



**Soaking up the sunshine**

All plants have a chemical in their leaves called chlorophyll. The chlorophyll is what makes the leaves of the plant green. But that is not the only job chlorophyll has. Its other job is to soak up the warmth and energy from the sun’s rays. Sun-energy isn’t all a plant needs to make its food, though. They also need water and air.

QUESTION 2

What are the main jobs of chlorophyll?

**Drink up!**

While the leaves are collecting energy from the sun, they are also pulling water up from the plant’s roots. The water, which is in the soil, travels through the roots, up the stem and into the leaves…kind of like a big straw. But that’s not all…

Water enters the roots via a plant cell called xylem. One issue that most land plants have is drying out. But plants are very clever and have a specialized structure called stomata which will not allow carbon dioxide to pass through its protective waxy layer covering the leaf (cuticle).



**Take a deep breath**

Plants have to breathe just like you and I do. The difference between plants and people, though, are what we need to breathe.

QUESTION 3

What is the human system used to breathe?

Take a big deep breath and hold it. You are breathing in oxygen. Now let it out. The air you let out is carbon dioxide. Plants do the same thing, except when they take a deep breath, they breathe in carbon dioxide and when they let it out, it is oxygen.

Now you might be thinking you’ve never seen a plant breathe before. That is because you haven’t—not the way you and I breathe, anyway. No, a plant takes in carbon dioxide without anyone even noticing.



**How plants breathe**

You have already learned that the sun’s energy enters the leaves through the chlorophyll in the leaves. A plant’s leaves also have hundreds of thousands of tiny holes in them called stoma. The stoma are so small you have to have a microscope to see them, but they are big enough to breathe in the carbon dioxide a plant needs to make its food.

Plants take in carbon dioxide through their leaves at the same time they are soaking up energy from the sun and taking a drink of water.

Wow! I bet you never realized how busy or important a plant’s leaves are, did you?

Once the leaves of a plant have collected enough carbon dioxide, water and sun-energy, they are ready to make food for the entire plant.



**Dinner time!**

When the carbon dioxide, water and energy from the sun are combined, the sun turns the water and carbon dioxide into glucose (sugar). The plant uses the glucose as food and takes hydrogen molecules from the water to keep itself from getting dry and wilted.

Glucose gives the plant energy. They use this energy to make more leaves, flowers, fruit or vegetables and seeds that can grow into new plants. The glucose also gives the plant the energy it needs to grow taller and fuller and make the cell walls of the plant.

QUESTION 4

Name all the uses of glucose for a plant.

We know why it is important for flowers to make new leaves, flowers, fruits, vegetables and seeds, but why are the plant’s cell walls so important?

**On guard!**

The cell walls of a plant have two main jobs:

* Surround the actual cells of the plant.
* Protect the plant.

Every living thing is made up of cells and every plant cell has a cell wall. The cell walls of a plant are near the surface or outside of the plant—the part we see. Because they are so close to the outside of the plant, the cell walls of a plant:

* Help keep bugs, insects and diseases from attacking a plant
* Help keep the plant standing straight and tall

**All filled up**

When a plant combines water, carbon dioxide and sun-energy to make the glucose there is always something left over. It is called oxygen—the very same oxygen we need to breathe. Because the plants don’t need it, they get rid of it. When a plant gets rid of the oxygen they don’t need, it is called respiration. A plant gets rid of oxygen through its leaves, stems and flowers, fruits or vegetables. And when they do, we have the oxygen we need. Thanks, plants~ Photosynthesis facts:

* Photosynthesis is the most important chemical process in the world. Without it, plants and people could not exist.
* A plant’s leaves are vital for its survival. Most of the photosynthesis process takes place in the leaves of a plant.

As long as you follow these five simple rules, you can grow your own bug-eating plants. Isn’t that cool!

**Some super facts**

1. Photosynthesis is the most important chemical process in the world. Without it, plants and people could not exist.

2. A plant’s leaves are vital for its survival. Most of the photosynthesis process takes place in the leaves of a plant.

**Fun experiment**

* Place one cotton ball in the bottom of two small jars or cups (1 cotton ball in each).
* Place 2 dried beans on each cotton ball and moisten with water.
* Cover the beans in both containers with another wet cotton ball.
* Place one container in a sunny location such as a window sill.
* Place the other container in a dark location (closet or cabinet).
* Check them each day to see which one grows best.
* Ask yourself: How did photosynthesis work in this experiment?

QUESTION 5

Hypothesize what the outcome of this experiment would be and explain why.



**Useful Website:**

What is photosynthesis? Go to: **learner.org.librus.hccs.edu**